Attachment 2

System Capabilities and Characteristics Parameters

System Capabilities and Characteristics Parameters	Thresholds	Objectives
4.1.1. Integration (Wear/Fit/Comfort)	The T-38 cockpits (forward and aft), including the escape system, must be capable of being safely and efficiently operated by aircrew members from JPATS cases 1-6, and pilot nude weight range of 103-245 lbs.	JPATS cases 1-7 and pilot nude weight range of 103-245 lbs should be accommodated as a goal. The escape system and interfaces must functionally and physically integrate with existing life support equipment as identified in the table in paragraph 4.1.1, and as worn by the defined population.
4.1.1.2. Wear Duration	Equipment must be designed and developed to support individual fit and comfort throughout maximum wear/flight duration of 2.0 hours.	N/A
4.1.1.3. Altitude Protection	System/components must allow users to safely operate at altitudes from sea level to 50,000 ft for the duration specified in paragraph 4.1.1.10.	N/A
4.1.1.4 Thermal Protection	Systems/components must provide protection against thermal energy exposure as a result of an ejection, or canopy jettison. Crew member exposure to thermal energy as a result of escape system utilization by either of the aircraft occupants or rescue personnel shall not exceed a burn depth of 100 microns.	N/A
4.1.1.5. Noise Attenuation	During both normal and ejection conditions, the escape system must not contribute to a cumulative noise exposure that exceeds safe occupational limits.	N/A

4.1.1.6. Decompression Protection	System/components must protect against all possible pressure differential events between the cabin altitude and the atmosphere at aircraft altitude during explosive/rapid decompression.	N/A
4.1.1.8. Head Protection	The integrated escape system/life support equipment shall protect the member's head and neck from impacts and penetrations associated with basic aircraft maneuvers as well as during operation of the ejection seat. This protection must be maintained through speeds compatible with the ejection seat capabilities. Head protection must be stable, within center of gravity standards, comfortable to the user, and not cause neck injury, muscle fatigue/strain during normal or emergency use.	N/A
4.1.1.9. Flotation (Anti-Drown) protection	The escape system must provide sufficient volume/space to store the survival and flotation equipment. The escape system must provide the crew controls to select automatic deployment of the survival kit and life raft. The system must not damage the survival and flotation equipment during ejection or on deployment. Equipment must prevent dragging through water by the parachute and operate: (1) manually with either gloved hand, and (2) automatically without any action required by the user.	N/A
4.1.1.10. Breathing Systems (Oxygen)	Equipment must provide and transport from the source, the desired breathing gases for altitudes and accelerations commensurate with the T-38 aircraft oxygen system. Emergency oxygen must be available for manual deployment in the cockpit and automatically deployed for ejecting from the maximum altitude of the ejection seat. The emergency oxygen system shall provide a minimum of 10 minutes of physiologically compatible oxygen consistent with a constant rate of descent, from maximum operation altitude to 15,000 feet barometric altitude during emergency descent or to seat and man separation.	N/A

4.1.1.11. Acceleration Protection	Systems/components must provide protection to the user for acceleration rates during the ejection process. Accelerations should be limited to provide functional escape for ejection airspeeds of 550 KEAS.	Accelerations and head and neck loads experienced during ejection must be controlled and limited to minimize risk of personal injury.
4.1.1.12.1. Basic Protection	System/components must shield the eyes from adverse effects of solar radiation, windblast, airborne debris during bailout/emergency ejection, and protect eyes during missions/ground operations where facial cover is required; i.e., takeoff/landing, airborne/airlift, rescue/recovery missions, etc. Design solutions must account for use of corrective lenses and eyeglasses.	Should changes be required to current, off-the-shelf military specification hardware, the replacements must meet applicable military specifications and be capable of supporting both clear and neutral density, 30% transmittance eye protection for day and night operations respectively.
4.1.1.13. Ejection	Ejection systems/components should increase the stability of the seat at high speed, expand/increase aircrew safety during bailout events, and expand the ejection envelope to more closely coincide with the operational envelope of the T-38 aircraft. Ejection systems/components must match existing life support equipment components. Escape system performance must provide for safe ejection for aircrew members from JPATS cases 1-6, and pilot nude weight range of 103-245 lbs. The maximum functional ejection speed capability must be 550 KEAS, with a goal to permit functional ejection up to 600 KEAS. The escape system will incorporate a seat mounted parachute system and an interseat system. The interseat system will provide a means for both pilots to eject with the pulling of a single ejection handle and will include seat sequencing for ejection. The escape system must be optimized for performance in aircraft out of control ejections, aircraft flight traffic pattern altitudes/airspeeds/configurations, and high sink rate conditions. Recovery parachute deployment will be possible before seat/man separation.	JPATS cases 1-7, and pilot nude weight range of 103-245 lbs should be accommodated. The ejection seat shall be instrumented with sensors adequate to collect data to determine the performance of the ejection system and to determine if the system performs within human tolerance criteria. These sensors include but are not limited to seat accelerometers, seat pan accelerations, seat back accelerations, and seat cushion accelerations.

4.1.1.13. Ejection	The maximum functional ejection speed capability must be 550 KEAS,	with a goal to permit functional ejection up to 600 KEAS
4.1.1.15. Restraint/ Deceleration/Descent	The escape system must provide active restraint for the occupant's legs. System shall successfully protect both arms (desired) and both legs (required) for the ejection sequence up to seat/man separation for the full performance envelope of the ejection system. System shall integrate with the operation of the aircraft without human performance degradation and shall be capable of retrieving limbs from all normal limb positions during aircraft operations. Provisions shall be incorporated for seat and crewmember stability during free flight, including the period from rocket ignition through recovery parachute deployment.	N/A
4.2.1. System Inspection Interval	Inspection intervals on current use equipment vary based on use, storage, packing methods, etc. In no circumstances will inspection intervals be less than current use equipment; e.g., oxygen mask - 30 day interval, ejection seat survival kits - 120 day interval, ejection seat phase inspections – 2 years, parachute repacks – 1 year.	System equipment/components should be designed/tested to extend inspection intervals so as to reduce hands-on maintenance, installation, and removal from aircraft, etc.
4.2.2. Storage and Service Life	System equipment/components will have a minimum 4-year storage (shelf) life. Service (operational) life will be the maximum possible length of time and will be at least 75 percent of shelf life (e.g. a component with a 8 year shelf life will have a minimum of 6 year service life).	However, new technologies, materials, and packaging methods should allow for much higher storage and shelf lives, e.g. 5 to 10 years.
4.2.2.1. Cartridge Actuated Devices/Propellant Actuated Devices (CAD/PAD)	CAD/PAD components will have an initial storage (shelf) life of 5 years and an initial operational (service) life of 3 years.	Design life of 10 years, both shelf and service life is desirable.
4.3.6.3. Fire Safety	Systems/components on the ejection system such as back rest	

	pads, leg restraints, lap belts, seat cushions shall be flame retardant.	